

## **Effect of global climate change on wintertime urban heat island intensity of Tokyo metropolitan area**

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During the recent 100 years, mean surface air temperature (SAT) increased about 3 K in Tokyo, while the world mean SAT increased only 0.66 K. The major reason of the difference of the warming is the effect of urban heat island (UHI), whose intensity also increased during the period and often largest during winter. This study investigates the change in UHI intensity (UHII) of Tokyo metropolitan area by the effects of global climate change. Present climate simulation is conducted using a high-resolution numerical climate model (WRF) including an urban canopy sub-model. Future climate run is also conducted using Pseudo-Global-Warming method assuming the boundary conditions in 2070s estimated by a GCM under the SRES A2 scenario. The simulation results indicated that UHII would be enhanced more than 20 % during night, due to the global climate change. SAT in the urban area is more slowly increase during daytime due to the larger heat capacity than the rural area. Heat release from the buildings in urban area is larger than that in rural area at night, when the dispersion of the released heat tends to be restricted in the lower atmosphere because of weak turbulence. These processes are sensitive on cloud fraction and the atmospheric stability in the lower atmosphere.